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## THYMOL CHEMOTYPE *Origanum vulgare* L. ESSENTIAL OIL AS A POTENTIAL BIO-HERBICIDE ON MONOCOTYLEDONOUS PLANTS

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There is new attention on the search for natural compounds with herbicidal and/or pesticidal effect<sup>1</sup>, based on environmental protection. Natural substances, as volatile terpenes and essential oils (EOs), have been reported as regulators of germination and growth of other species in several ecosystems<sup>2</sup>. *Origanum vulgare* L., (Labiatae) in searching for new bio-based herbicides, less polluting and more environmentally friendly, is considered a promising source of essential oils to use with this aim. Scientific studies noted potential phytotoxic effect of *O. vulgare* EOs which were tested on various dicot plants<sup>2,3</sup>, but there is no evidence that *O. vulgare* thymol chemotype EO was tested for potential herbicidal activity with a selective effect on monocotyledonous and dicotyledonous. The main aim of the current research was to focus on the comparison of potential selective herbicidal activity of oregano EO on monocotyledonous (*Triticum aestivum* L. and *Hordeum vulgare* L.) and dicotyledonous species (*Lepidium sativum* L. and *Sinapis alba* L.). Additional GC/MS analysis of EO and evaluation of antimicrobial activities against some phytopathogens bacteria (*Clavibacter michiganensis*, *Pseudomonas syringae* pv. *phaseolicola*, *Pseudomonas savastanoi*, and *Xanthomonas campestris*) and fungi (*Monilinia fructicola*, *Aspergillus niger*, *Penicillium expansum*, and *Botrytis cinerea*), have also been provided. Finally, the antioxidant capacity, was determined. According to the GC/MS analyses, the EO belongs to the thymol chemotype *O. vulgare*, with high percentage of thymol (76%). The germination of four tested species was not influenced by the EO. The inhibitory effect on root length was statistically significant in the monocotyledonous species, while in the dicotyledonous ones, a stimulation effect was observed. Strong biological activity of *O. vulgare* EO was noted on all phytopatogen bacteria and fungi. In DPPH test, the EO showed an IC<sub>50</sub> = 106.6 µg/mL. On the basis of the results presented, it is possible to conclude that the essential oil of *O. vulgare* with thymol chemotype could potentially be used as a herbicide with selective effects on monocotyledonous plants.

### References

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